**PBL – Instep 2**

**Elementary**

**Math**

**Shapes for Sure:** You will be getting a puppy soon. Your home is too small to keep it in. Design a good holding pen to keep your new puppy safe, comfortable and happy.

**Caterpillar Confusion:** Mrs. Smith has a beautiful flower garden that she is very proud of. It attracts many hummingbirds and beautiful butterflies. Recently, many caterpillars have been in her garden and she is concerned that they may kill her flowers. Mrs. Smith has brought us a caterpillar along with the plant that she found it on. Please help Mrs. Smith decide what to do.

**The M & M Caper:** Earlier this week the Mars Candy Company had a break in. During the robbery one of the candy coating machines was broken. The scientists need to find out which color was affected. They are asking for students to see if they can discover which machine was damaged. Your job is to help the scientists.

**Endangered Species:** The WV Division of Natural Resources has compiled a list of threatened, rare and endangered species. This organization would like creative help from your class. They are looking for a fourth grade class that is interested in researching a plant or animal that is on the endangered list, and then developing a plan of action that will help the recovery efforts for that particular species.

**Weather Watchers:** Our weather man is going on vacation and needs our help. You and your group have been hired to prepare a forecast of the weather for the next two weeks. You will need to use weather instruments to record our local weather and make predictions for the next day's weather. Also, for the international weather forecast, you will pick a place you would like to visit and compare their weather to ours. You and your group are now meteorologists and need to keep the weather forecast alive.

**The Plight of the Monarch:** Monarch butterfly populations in the eastern United States and Canada appear to be decreasing. No monarch butterflies have been found in your geographic area this year. You have been commissioned by local environmentalists to determine why this is occurring and come up with a plan of action to counteract the problem.

**Time Flies:** Joey and Bobby had watched the stars the night before and thought they saw a falling star. The next morning they were out walking in a field and discovered several strange pods. When they gathered the space aged pods they found that their hands were sticky and white. The children brought the pods home and placed them in a cage. What should they do?

**Your rich uncle:** You have recently been notified by the local law firm that you are named in your recently deceased great uncle’s will. As his heir, you and your siblings will receive a moderate sized tract of land including mineral rights. You have been approached by the owner of a small mining company, who wants to mine particular minerals from the land. Prepare a presentation describing what you would do.

**Mars or Bust:** NASA has been working on many space exploration programs for the last 50 years. NASA started with rockets including Gemini, Saturn, and Mercury. They progressed to the space shuttles, satellites, other Mars space vehicles, Sky Lab and the International Space Station. Also the astronauts in our space program perform many important tasks while on a mission including science experiments, space walks, and research, some of which can be dangerous. Their perseverance and determination has brought the world to its most recent flight, the exploration of Mars.

You have been selected as a team of NASA astronauts to travel to Mars. You need to determine the necessary items you need to take with you to get to Mars, survive while on Mars, and return safely to Earth.

**Visiting Chameleon:** Our class has just received a message from the Zoo that a chameleon will be coming to live in our classroom. It will be with us for the entire school year. How can we create an environment in which it will survive?

**Middle School**

**Math**

**Acme Travel**: As a representative of Acme Travel in NJ, you have just received an email from National Travel Magazine. One of their reporters is coming into the state next month and wants to visit three of the “best” state parks in NJ. They will only be in the state for three days. Develop a plan for the reporter to use once he arrives at AC airport.

**Math**

**Life is a Highway**: You are currently working 20 hours a week at an after-school job earning minimum wage. You want a car, but your parents cannot afford to buy one for you. What do you do?

**Science**

**Mystery Plants**: A new island has been discovered in the Caribbean. You and your company have been hired to design plants that could be genetically engineered to live on this island. Present your recommendations to the rest of the class.

**Science**

**Ecosystems**: In a local newspaper an article appeared about a mine retaining wall that broke at Rock Creek and several small towns were flooded. The flooding brought destruction of property and released large amounts of polluted mine water. The Department of Interior, in connection with the New River National Park Service, wants suggestions on what can be done to prevent this in the future.

**Science**

**Co-Existence**: Your group has just been contacted by the Pittsburgh Zoo. The zoo has been notified that within four weeks they will receive a shipment of ten new animals. The zoo has limited space, but because of their contract, they must accept all of the animals. You have been hired as part of a consulting team to help the zoo determine what to do with the new animals. The zoo board expects a presentation from each group in two weeks.

**Science**

**Mimics:** Ms. Countless, the math teacher for Omega Middle School, is very rigid about the start of class and what is expected of students as they enter the classroom. She requires them to be in their seats and totally prepared with textbook, homework, paper and pencil by the time the bell rings. John, a student who never comes quite prepared with the proper tools for class, is always running at the last minute to the pencil sharpener before Ms. Countless’ class. He gets to the pencil sharpener with ample time, but each day it is as if the pencil sharpener has a vendetta against him. The handle feels awkward to his touch and just when he about has his pencil ready for class, the sharpener breaks off his point. So the battle continues each day and time and time again John barely makes it to his seat before the bell. Last Wednesday he was not so fortunate, the pencil sharpener consumed his one and only pencil right before the weekly quiz. Without a pencil, John failed his quiz. John vowed never again. He remembered reading how nature is used for inspiration and he began to think about how he could improve the pencil sharpener to make it more ergonomically designed by mimicking nature.

Your task is to look to nature for inspiration to design a product that mimics nature that could either solve a problem, simplify a task, or save money or energy. You have one week to present your group findings that describes your cumulative and individual efforts.

**Science**

**Forever Wild:** The native plants that thrive so beautifully in wild, wonderful, WV are exemplified by those found in our school’s outdoor classroom. However, these plants are becoming less prevalent in other local environments which have been disturbed by man. Your task is to compare and contrast natural and disturbed environments, to investigate and determine why there are fewer of certain plants in those locations that have been disturbed by man (for example, mining--deep and strip, logging, housing, burning, farming, highway building, etc.) and to communicate your findings and suggests ways that man can use and not abuse the environment.

**Math**

**The Wright Flight**: Stepping back in time, imagine for a moment that you are a member of the Wright Brothers’ aviator crew in 1902. Your most recent assignment is to recruit funding for their experimental flights. Air travel is a new concept and is exciting for some and scary for others. Most people of this time period cannot picture traveling from Point A to Point B by air. Your task is to convince local entrepreneurs to invest in the future models and share your ideas with the class.

**HS Math**

**Win the Bid:** You work for a commercial construction company and have been asked to prepare a proposal and submit a bid to the school board concerning the construction of a six classroom addition to the middle school. In your proposal you are to complete a spreadsheet which will contain a materials list and an itemized budget of the associated costs for the materials used to complete the construction project. Can you win the bid?

**HS Math**

**Take me out to the Ballgame:** The public relations director for the River Sharks baseball team has decided at the next game to throw out souvenir baseballs into the stands every time the team hits a home run. The director has ordered 2000 souvenir balls. The manufacturer must decide on the packaging for the 2000 baseballs and the mode of delivery. As an employee of the manufacturing company you must find the cheapest and most efficient source of packaging and delivery. The baseballs measure 10” in circumference and weigh 5 ounces. As an employee of the manufacturing company you must find the cheapest and most efficient source of packaging and delivery. The baseballs measure 10” in circumference and weigh 5 ounces.